OMNITEC DESIGN, INC.

Vulcan RT Heater
With Remote Temperature Controller

Congratulations for choosing *VULCAN RT* electric heating system. It is loaded with 37,000 BTU's (11KW) of heat power, 475 CFM of air flow and precise temperature controls. It features individually controlled heating elements and plug -in temperature controller with 15 ft power cable and 8 ft sensor. It can measure containment air or material temperature for efficient and safe heat control. Heater can provide **160°F air** for construction sites and restoration projects to shorten structural drying.

***Vulcan RT* delivers heat safely and efficiently where you need it... When you need it...**

CAUTION

Caution – High temperature, keep electrical cords, drapery and other furnishings at least 3 Ft (0.9 m) from the exhaust of the heater and from the side and rear.

Attention - haute température, garder les cordons électriques, les draps(couvertures) et d'autres fournitures à au moins 3 pi (0,9 m) de l'échappement de l'appareil de chauffage sur le côté et en arrière.

CAUTION

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
NO USER-SERVICEABLE PARTS INSIDE

Prudence
Risque d'électrocution
Ne pas ouvrir
Aucune pièce utilisable à l'intérieur

WARNING

This equipment to be operated only by trained personnel.
Do not use with combustible or explosive material.
Do not expose to water or rain.
Connect only to grounded outlet with GFCI device.
Disconnect power for cleaning and servicing.

Cet équipement à être exploité uniquement par du personnel qualifié.
N'utilisez pas avec des matériaux inflammables ou explosifs.
N'exposez pas à l'eau ou à la pluie.
Se connecter uniquement à la sortie avec dispositif de GFCI.
Coupez l'alimentation pour le nettoyage et l'entretien.

IMPORTANT INSTRUCTIONS
Read all instructions before using the heater.

⚠ CAUTION ⚠

- Connect **ONLY** to outlets that are properly grounded and have over-current protection rated at 50 amps maximum. Use power cords rated at 250 VAC/50 Amp with minimum of 3-#6 and 1-#8 conductors.
- Do not operate heater with damaged cord or plug, after a heater malfunction, or has been dropped or damaged in any manner. .
- Use EXTREME caution when operating the heating unit around children and anytime the unit is left unattended.
- To disconnect heater, turn all heating elements off, cool it down and turn blower off. Unplug the cord.
- Place cord out of the path of foot traffic to avoid trip hazard. Do not run the power cord under carpets, rugs or furniture.
- Do not use outdoors. Use only in DRY location and avoid placement where it could fall into water.
- The heater has hot and arcing or sparking parts inside. Avoid operating in an environment with flammable liquids, gas or paint. Do not use to exhaust combustible or explosive gases or operate in hazardous atmosphere.
- Do NOT operate the Vulcan without air filter. Do not insert or allow foreign objects to enter intake or outlet openings as this may cause electrical shock or fire or damage heater.
- Heater will be hot during operation, use handles when moving.
- To prevent possible **FIRE, DO NOT BLOCK OFF INTAKE OR EXHAUST**. The hot air exhaust should not be located less then 3 feet from wall and soft goods, i.e. clothing, linens, pillows, paper. The sides of the unit should be at least one foot away from the wall or soft goods.
- Do NOT cover an operating machine.
- The appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.
- Children being supervised not to play with the appliance.
- Use the Vulcan only as prescribed, any other use may cause fire, shock or injury to persons.
- Always unplug unit when not in use. See proper shutdown procedure in this manual.
- **SAVE THESE INSTRUCTIONS**

⚠ WARNING ⚠

“GROUNDING INSTRUCTIONS - This appliance must be grounded. In the event of a malfunction or breakdown, grounding will reduce the risk of electric shock by providing a path of least resistance for electric current. This appliance is equipped with a cord having an appliance-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is installed and grounded in accordance with all local codes and ordinances.”

“WARNING - Improper connection of the appliance-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or service representative if you are in doubt whether the appliance is properly grounded. Do not modify the plug provided with the appliance; if it will not fit the outlet, have a proper outlet installed by a qualified technician.”

AVERTISSEMENT:

"INSTRUCTIONS DE MISE À LA TERRE - Cet appareil doit être mis à la terre. En cas de défaillance ou de panne, la terre réduira le risque de choc électrique en fournissant un chemin de moindre résistance au courant électrique. Cet appareil est équipé d'un cordon comportant un conducteur de l 'appareil à la terre et une prise de mise à la terre. La prise de mise à la terre doit être branchée dans une prise électrique appropriée, installée et mise à la terre conformément aux codes et règlements locaux."

"ATTENTION - Une connexion incorrecte du conducteur de l 'appareil à la terre peut entraîner un risque de choc électrique. Vérifier avec un électricien qualifié ou un représentant de service si vous êtes dans le doute si l'appareil est correctement mise à la terre. Ne pas modifier la fiche fournie avec l'appareil;. si elle n'entre pas dans la prise, faites installer une prise adéquate par un technicien qualifié."

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SPECIFICATIONS

MODEL: OVH 230 RT

Power Supply: 230VAC/60Hz/1 phase

50 amps *supply* - can operate all 6 heating elements, 37,000 BTU output

30 amps *supply* - can operate up to 3 heating elements, 20,500 BTU output.

Note: *Vulcan RT* can operate on 208 VAC at reduced heat output

Blower/Motor:230VAC/60Hz/1.13 amps, thermally protected, 950 CFM free air flow.

Air flow controls: Blower Off/On switch - Airflow is 475 CFM with MERV 11 filter in place.

Temp Control: - High temperature limit switch set at 160° F internal temp. shut off and 135° F automatic reset.

- Plug-in Temperature Controller with adjust able settings from 0° to 160° F. Included is 15 ft power/control cable and 8 ft sensor cable for monitoring and controlling temperature.

Safety Shutoff: Loss of air flow and/or internal heater temperature above 180° F will shut off all active heating elements.

Heating Elements: Industrial, tubular, finned design, 3 - 2100W.(30 amp service) and 3 - 1700W

Filter: Pleated media MERV 11, 65% efficiency, 12”x12”x2”.

Housing: Aluminum/galvanized metal, epoxy powder coated; size 11 1/4”w x 30”l.x18”h with casters; Dual, insulated wall around heating elements; Recessed control panel; 2 soft carrying handles.

Duct Connections: Intake: 10” diameter connection . Outlet: 10” diameter ring.

Maximum ambient operating temperature:
158° F (70°C)

Operation: Suitable for indoors, **DRY** location only.

Tested by TUV lab to comply with UL 1278 and CSA / IEC 60635-1 & -2 electrical safety standards. The heater is NEC compliant.

PARTS LIST ..... PART #

***Vulcan Heater* .....OHV 230 –RT**
Pleat Filter 12"x12"x2" OPF1212
Quick Clamp, 10".....QCW12
Flexible Duct, 10"x25' OAD10
Thermocouple K , 25 ft RTS12

Options and Replacement Parts:
Range Adapter 8' 50 amp 125/250 ..... EDP50R
Dryer Adapter 8' 30 amp 125/250 .....EDP30D
Range Adapter 15' 125/250/50 amp EDP50/1
Dryer Adapter 15' 125/250/30 amp EDP30D
Temperature controller
w/cables and sensor .....RT
Replacement temp. sensor, 8 ft cable .....RT
Replacement Temp. controller cable
with connector .....RT

Introduction

The manual is a guide for safe operation and maintenance of the Vulcan unit. Please read and understand this manual completely before operating and installing the heating unit on a job.

Vulcan RT Operation Overview

Vulcan RT delivers up to 37,000 BTU and 475 CFM air flow at temperatures from ambient to 160° F. The heater outlet can be ducted to deliver heat where needed. The air intake could be open to ambient air or ducted from a dehumidifier. Vulcan RT can safely operate in 150 F environment.

When operating with all 6 heaters at full airflow the temperature rise is 75° F and at 350 CFM is 95° F above the ambient air. When operating on 30 amp circuit with 3 heaters, the temperature rise is 55° F. At lower air flow, the heat rise will be higher. The airflow can be reduced by 10 to 8" or 10 to 6" dia. reducer slipped over the heater outlet and by using flex duct..

Vulcan RT is designed for indoor use only and it is important to locate heater in dry, safe location. Heater exhaust must be 3 feet or more from a wall or any soft material. When ducting hot air to a remote area, using shorter duct reduces heat losses. Please read Safety warnings before starting to operate your new Vulcan. Unit may be operated in horizontal or upright position with exhaust aiming up. **Do NOT lay unit on air intake side or block the outlet.**

Depending on the 30 or 50 amp power supply, 1 to 6 heating elements can be selected Depending on your ambient temperature, and required temperature rise, the number of operating heating elements will vary.

Vulcan RT offers excellent heat control with 6 heating elements which can be individually turned on as needed. Reducing airflow with outlet reducing collar will increase the air outlet temperature.

After starting the blower and selecting number of heating elements, the heater temperature could be maintained in MAN (Manual) or AUTO mode. In **MAN,** the High temperature switch shuts off heating elements when **internal heater temperature is 160º F** and restart at 135º F. In **AUTO mode,** the Temperature Controller measures remote air or material temperature. and compares it with selected Set Point. Temperature Controller automatically turns heating elements on and off to maintain the Set point..

The Safety circuit protects the unit from overheating. If heater looses a minimum required air flow, all the heaters will shut down until the airflow is restored. Also, if internal heater temperature reaches 180º F, the safety thermo switch TS-1 shuts the heating elements down and restarts automatically at 170° F.

Electrical Requirements: ***Vulcan RT*** unit requires 230VAC/ 1 Phase power source with over-current protection rated at 50 amp maximum. It can be dryer/range outlets, generator or hardwired into electrical panel by a certified electrician. The amperage draw will depend on the number of elements engaged. ***Note:*** **Heater can operate on 208 VAC at reduced heat output.**

Operator's Controls (figure 1)

#1 On/Off switch.
#2 Hour meter displays the hours the unit operates.
#3 Connector for plug-in Temperature Controller
#4 Temperature Control mode selector switch with MAN /AUTO positions.
#5 Heaters switches 1 true 6 - ON/OFF switch with internal light. Lights illuminate as each heating element is activated. If the element is not activated, the switch light will not be illuminated.

Air Flow Control: figure 1, #1

The On/Off switch turns the blower on and the AIRFLOW status light will be illuminated

Hour Meter: figure 1, #2

The digital hour meter measures the cumulative time the unit is running to tenths of an hour. It stores and displays the total time when the unit is disconnected from power supply.

Temperature controller: figure 1, #3

Temperature Controller cable is plugged into control panel for 230VAC power and provide automatic temp. control. It is programmed to maintain user selected Set Point temperature when AUTO mode is selected Place the sensor end in containment area to monitor air or materials temperature to prevent overheating delicate parts of structure.

Status Lights: figure 1

- **POWER** - Red light indicates power to the unit is On.
- **AIRFLOW** - Amber light indicates blower is operating and the air flow switch is closed.
- **SAFETY**– Amber light indicates the air flow is safe and the heater internal temperature is below 180° F.
- **HEATER ELEMENTS** - Each heating element switch illuminates when switched ON and active.

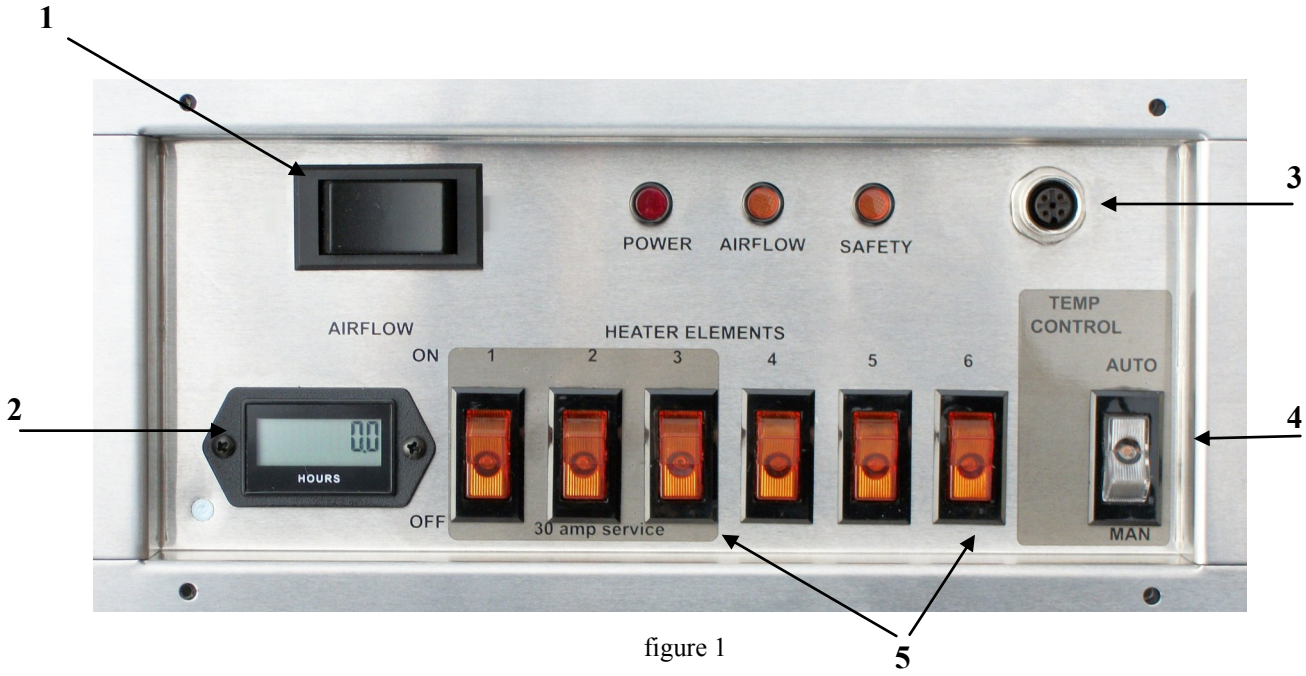


figure 1

OPERATING INSTRUCTIONS

Unpacking: Check unit for damage. Don't operate when damaged in any way.

Operation:

1. Inspect Vulcan RT and the power cords for any damages before using. Do not use the system or the cords if damaged. See caution statement.
2. Locate the unit in safe DRY area. See WARNINGS and CAUTIONS on page 2.
3. Turn all heater switches OFF and switch to control to MAN**.** Connect the Temp. Controller to the control panel receptacle.
4. Plug your unit into 230VAC/1 phase, 30 or 50 amp power supply. POWER light will come ON.
   Note: Use only power source with ground and over-current protection rated 50 amp max. The power cord should be rated for 250 VAC/50 amp service and have minimum of 3-#6 and 1-#8 conductors. Operation on 208 VAC will produce lower heat output.
5. Turn switch ON and the AIRFLOW status light will turn ON.
6. When AIRFLOW light is on and internal heater temperature is less then 180° F, the **SAFETY** light will turn **ON**.
8. Turn ON the individual heating elements, starting with #1. For 30 amps power supply, only 3 elements (20,500 BTU) can be on, for 50 amps, all 6 heaters (37,000 BTU) can be turned on.

Manual Temperature Control: Temperature Control switch should be in MAN position. To regulate the heater temp., activate only number of heating elements required for the heat rise. Decreasing airflow will increase the exhaust air temperature.

Internal heater temperature is limited to 160° F. When this high limit is reached, thermo switch TS-2 turns all active heaters off and automatically restarts at 135° F.

Note: The hot air exhaust temp. may be considerably higher then 160 F. If the 160° F thermo switch is frequently turning the heaters OFF/ON, reduce the number of heating elements or increase the air flow to stay below 160° F.

Auto Temperature Control: Plug-in Temperature controller should have Set Point at desired temperature (up to 150°F) before switching to Auto Temperature Control Mode. Locate the sensor in measured area or targeted material. The Temperature Controller will display the measured temperature and selected set point SP.

When SP temperature is reached, Temperature Controller will turn heating elements Off and automatically restart when temperature drops 5°F below the SP. ***Note:*** See user manual for simple programming of ETC Temperature controller.

After the heater stabilizes at your required temperature, check the operation of the heating elements. If the Temperature Controller is frequently turning the heaters OFF/ON, reduce the number of active heaters.

Shut Down Procedure

The heat energy stored in the heating elements could heat up the outer surface of the unit if it is shut down without any cooling down period. To prevent this and to maximize the life of the heating elements, follow this procedure:

1) Switch all heating elements to **OFF** position
2) Allow blower to run for 2 minutes or until air flow has cooled
3) Switch blower to **OFF** position
4) Disconnect cords and store the unit

Operation Tips:

Each heating element operating on 230 Vac, draws 8.5 amps, raises air temperature by 15° F and supplies about 6,200 BTU's.

The High temperature switch TS-2, will turn the heaters Off and On between 160° and 135° F. To minimize the cycling , balance the airflow and the number of active heaters. Watch the heater switches lights to see the ON/OFF operation.

When internal heater temperature reaches 160°F limit, the exhaust air temperature would be around 180°F) . Take this in consideration when ducting hot air to a remote containment area and setting Temp. Controller SP.

The temperature **Safety** switch will turn the heaters Off and On between 180° and 170° F. This is a safety cut-off and heater should not operate this hot and the TC Set Point should be reduced. When safety switch shuts the heaters down, the **SAFETY** light also turns off.

Maintenance:

The blower and motor do not require any maintenance when the heater is operated with MERV 11 filter in place. Replace filter as needed. If filter becomes clogged with debris it will reduce the performance of the unit.

ALWAYS UNPLUG FROM POWER BEFORE OPENING THE UNIT.

Trouble Shooting

This guide may identify easy to correct problems in Vulcan operation and does not require opening the unit. Only qualified maintenance person should replace internal heater parts. Removable control panel provides easy access to panel mounted components. The heating elements and blower motor can be accessed by removing cover panels on the bottom.

Note: Start testing with Temperature Control switch in MAN position.

Problem - POWER (red) light does not come on when plugged in 230 Vac/1 ph power.

- Check the power supply source and the extension cords are in good working condition and providing 230V .

Problem - Blower is running, but AIRFLOW light is off

Increase the blower speed until the AIRFLOW light comes on - if no AIRFLOW light comes on and contactors do not energize (loud click), problem could be:

- Faulty air flow switch

Problem - Blower is running, AIRFLOW light is on but SAFETY light is off while heater is cool.

- TS-1 Safety thermo switch needs to be checked. It is set to open at 180° F and close again at 170° F.

Problem - Blower is running, AIRFLOW and SAFETY lights are on, but contactors do not click on (heater switches do not illuminate when switched ON).

- If heater is hot, let the airflow cool it down. High limit thermo switch TS-2 is set to open at 160° F and reset automatically at 135 F.
- One or both contactors could be faulty.

Problem : Both **c**ontactors are energized, but some heater switches do not illuminate when selected. Note: Contactor #1 controls heater elements 1, 2 and 3; Contactor #2 controls heater elements 4, 5 and 6.
Test:

- Turn ON one heater at the time to check each heater circuit. The heater switch will illuminate when heater is turned on and functioning.
- Check the heater output for the temperature rise.

If selected heater switch does not illuminate, problem could be:

- Faulty heater switch or heating element

Problem — Heater is frequently cycling ON and OFF as the High temperature switch operates between 160° and 135° F. Watch heaters switch lights for cycling frequency.

- Reduce number of heating elements turned ON.
- Check for obstacles on suction and discharge side. This could be dirty filter or a long ducting.

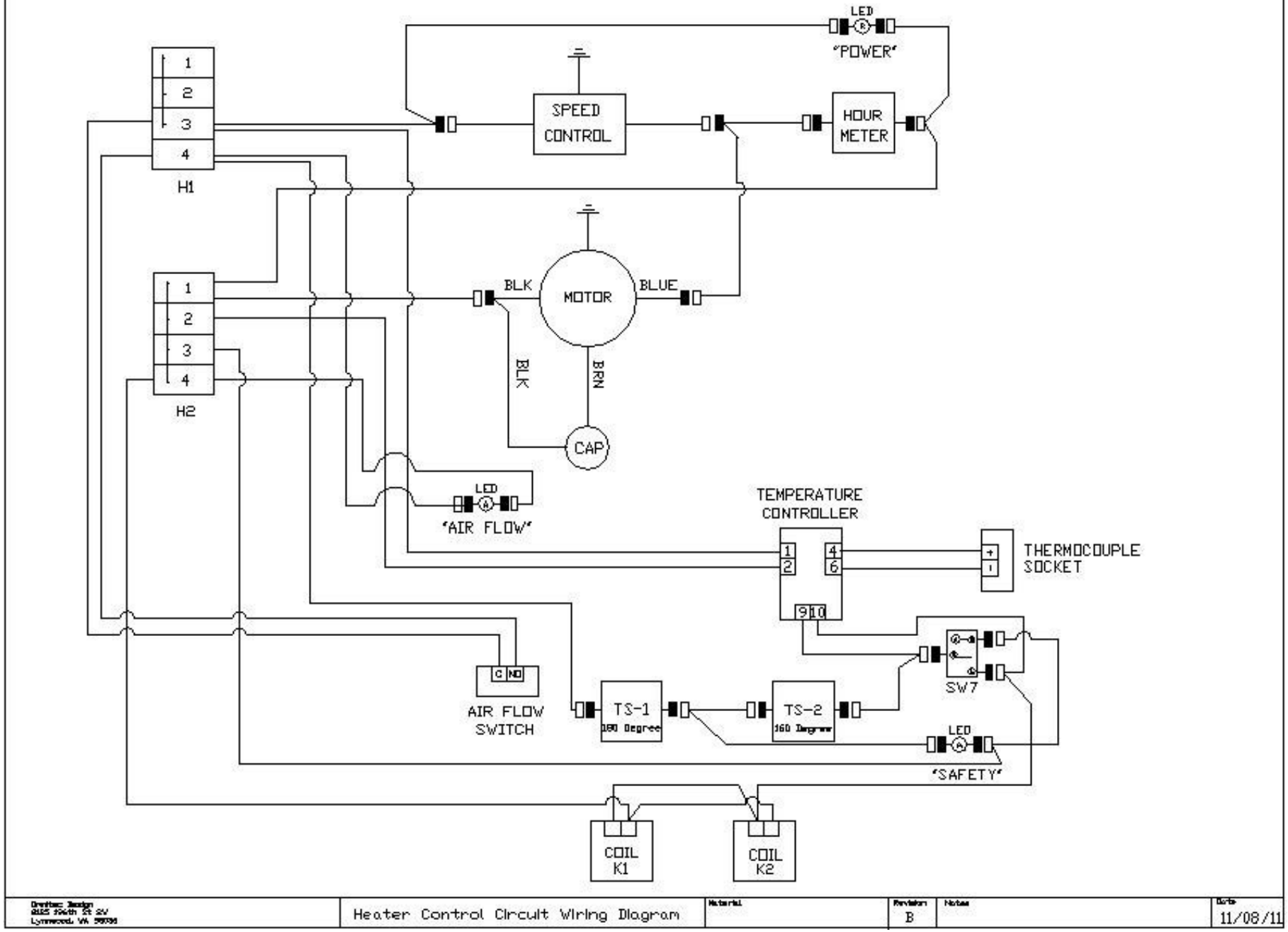
Temperature Control in AUTO mode

Problem - Heater works when Temperature Control switch is in MAN but heaters turn off when TC controls the heaters in AUTO. **Temp. Controller (TC) is plugged in, but LCD display is off.**

- Check connector - 4-contact socket on the control panel provide 230 VAC power for TC and two contacts provide on/off heater control.
- While in MAN Temp. Control mode, check TC program settings and LCD display. **See ETC User manual for operation and troubleshooting instructions.**
- Select SP at least 15°F below ambient temperature
- Switch to AUTO mode and contactors should energize selected heaters. When SP is reached, the heaters are turned off till temperature drops below SP (5° F dead band is recommended) , then turned on again.

- The SP temperature must be set above the temperature measured by the sensor for heaters to turn on - use Up/Down arrows to change the SP.

NOTE: Safety temp. limit switch shuts down heater at 180 F internal temperature even if the Temp. Controller SP calls for more heat.


LED
"POWER"
SPEED CONTROL
HOUR METER
1
2
3
4
H1
H2
BLK
MOTOR
BLUE
BLK
BRN
CAP
LED
"AIR FLOW"
TEMPERATURE CONTROLLER
THERMOCOUPLE SOCKET
SW7
AIR FLOW SWITCH
TS-1
180 Degree
TS-2
160 Degree
LED
"SAFETY"
COIL K1
COIL K2
Heater Control Circuit Wiring Diagram
Revision
B
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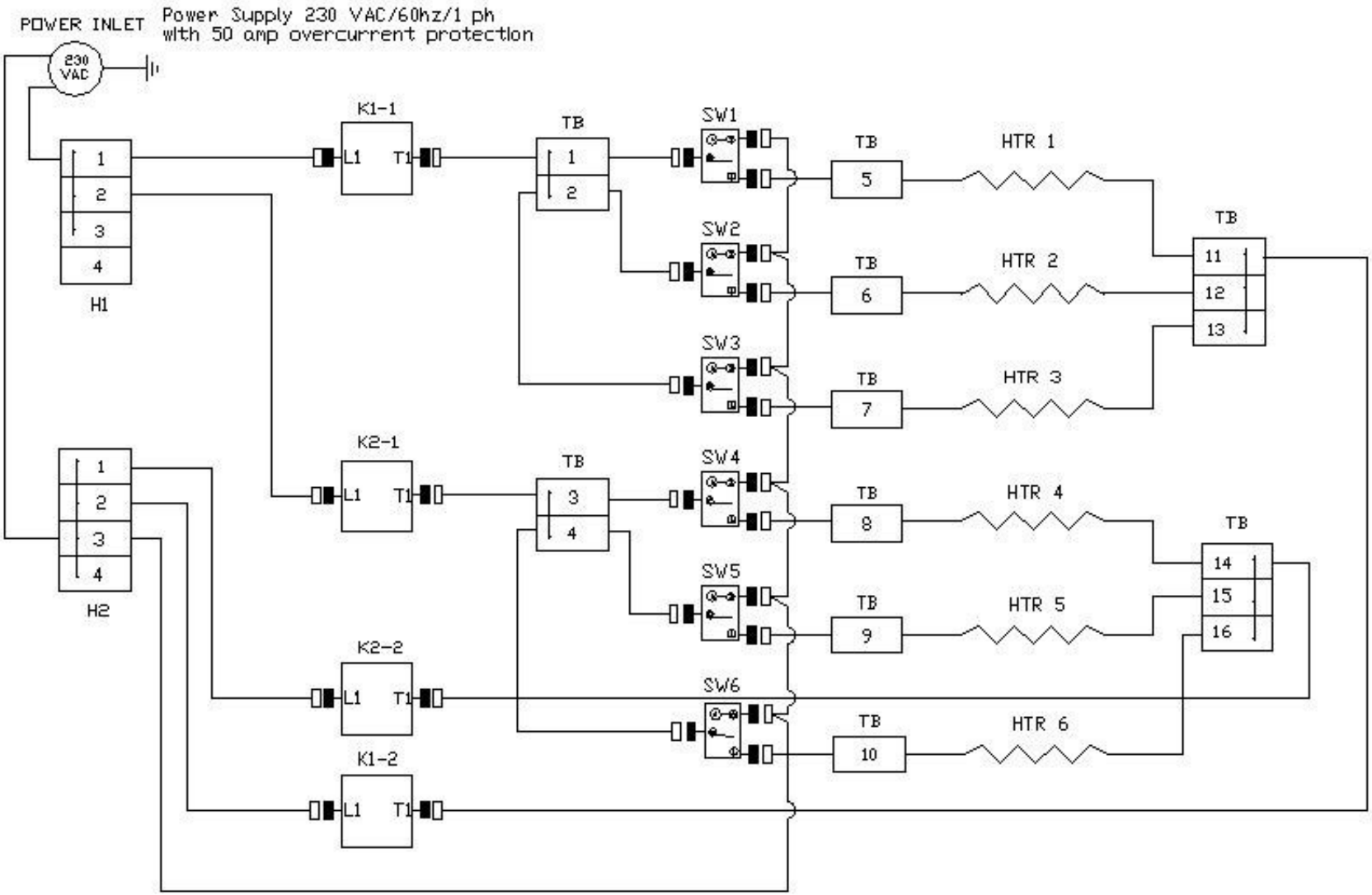

Heater Power Circuit Wirng Diagram		Revision B		Date 11/04/11

LIMITED WARRANTY REGISTRATION

The undersigned has read and understood the below Warranty, Limitation of Warranty and Limitation of Remedy

PRODUCT: Vulcan 37K

SERIAL #_____ PURCHASED FROM_____DATE_____

CUSTOMER:

COMPANY_____PHONE_____

STREET_____

CITY_____STATE_____ZIP CODE_____

BY_____DATE_____

SEND TO: OMNITEC DESIGN, INC., 2125 196th St. SW, Suite 115, Lynnwood, WA 98036

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